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Preexisting mental disorders are not always considered in mental health studies with military populations, even though prior diagnoses may be a risk factor for additional psychiatric harm stemming from combat exposure, as well as postdeployment behavioral problems. The objectives of this study were to investigate postcombat psychiatric and career outcomes among Marines with preexisting mental disorder diagnoses who deployed to combat in Iraq, Afghanistan, or Kuwait from 2002 to 2008. Marines with a preexisting diagnosis were 3.6 times ($p < .001$) *more likely to have at least 1 postdeployment mental health disorder within 6 months postdeployment compared with Marines with no prior psychiatric diagnoses. Marines with a preexisting diagnosis were also 1.8* ($p < .001$) *times more likely to receive a new-onset psychiatric diagnosis within 6 months postdeployment, indicating that postdeployment mental health concerns in this cohort extend beyond continuation of earlier disorders. Additionally, demotions and separation were significantly associated with having any preexisting mental health diagnoses (yielding odds ratios of 2.34 and 2.00,* $p < .001$, *respectively. Based on the current findings, it may be advisable to mandate a full medical and psychiatric record review during deployment health screening as part of new initiatives to address whether combat exposure has worsened preexisting conditions or compounded them with new-onset concerns.*

Although mental disorders following combat deployments have been the subject of considerable research (Hoge, Auchterlonie, & Milliken, 2006; Milliken, Auchterlonie, & Hoge, 2007; RAND Corporation, 2008), disorders identified prior to initial combat deployments have received little attention despite their potential relevance to longer-term psychological outcomes. Moreover, deployment of military servicemembers with prior mental disorders is not a rare phenomenon. For example, Taubman (2009) reported that almost 80,000 American military personnel (7.7% of all deployers) sent to Iraq or Afghanistan between January 2002 and December 2008 had a psychiatric diagnosis during military service but prior to their first combat deployment. Larson, Highfill-McRoy, and Booth-Kewley (2008) analyzed mental health data for 41,561 Marines deployed to Operations Iraqi and Enduring Freedom (OIF/OEF) between July 2001 and September 2005. Almost half (48.9%, $n = 2{,}395$) of those diagnosed with a psychiatric disorder had a mental health diagnosis assigned by a military provider prior to their first combat deployment. Not all military mental health studies document preexisting conditions; therefore, it is possible that some mental health disorders classified as "war induced" are instead a continuation of preexisting problems; posttraumatic stress disorder (PTSD) is an important exception.

Mental disorders are significantly associated with poor stress coping (Brewin, Andrews, & Valentine, 2000; Bromet, Havenaar, Gluzman, & Tintle, 2005; Dirkzwager, Grievink, van der Velden, & Yzermans, 2006; Norris et al., 2002; Ozer, Best, Lipsey, & Weiss, 2003; van der Velden & Wittmann, 2008). It is therefore likely that prior disorders affect coping with stressors experienced during combat deployments, such as direct life threat, witnessing carnage, long working hours, sleep deprivation, other challenges associated with adjusting to operational environment and demands, and disrupted family relationships. Subjective feelings of stress can vary widely among deployers, and we hypothesize that part of this variation reflects prior psychiatric history. Supporting evidence comes from research on mental health following man-made and natural disasters, which, like combat, may involve intense emotional strain. Although there is uniqueness among the severity, social context, and psychological impact of each trauma, certain high-risk

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groups for psychiatric sequelae have been consistently identified, such as persons with prior mental health diagnosis and those whose trauma exposures were most severe (Bromet et al., 2005; Norris et al., 2002). For example, two longitudinal studies that evaluated the aftermath of man-made traumatic events found that pretrauma psychological history was one of the strongest predictors of posttrauma mental health symptoms (Bromet et al., 2005; Dirkzwager et al., 2006). Additionally, multiple examinations of PTSD have established a link between psychiatric history and an increased risk of PTSD after exposure to a traumatic stressor (Brewin et al., 2006; Norris et al., 2002; Ozer et al., 2003), suggesting that prior psychological maladjustment is associated with diminished resilience.

Evidence from civilian research suggests that compared with their peers who have lesser prior mental health concerns, servicemembers who deploy with preexisting psychiatric problems may be at a relatively high risk for further psychiatric harm when exposed to the stress of combat. It is important to note that this risk has been addressed by the U. S. Department of Defense (DoD) through recently updated policy guidance for deployment-limiting psychiatric conditions (DoD, 2010). Specific conditions limit the deployability of a servicemember; however, many preexisting conditions are not completely restrictive if a predeployment clinical evaluator has determined that the condition has not impaired occupational functioning and is not likely to worsen during deployment (DoD, 2010).

Very few studies published thus far (Taubman, 2009; Warner, Appenzeller, Parker, Warner, & Hoge, 2011) have prospectively examined mental health outcomes for deployed personnel with preexisting conditions. Taubman (2009) analyzed medical data collected from all U.S. Armed Forces active-duty personnel who deployed to combat in Iraq or Afghanistan at least one time between January 1, 2002, and December 31, 2008. After identifying each participant's first combat deployment during the study period, all medical encounters with a mental disorder listed as the primary diagnosis were classified as "predeployment" or "postdeployment" diagnoses. Taubman's analysis indicated that among deployers with any predeployment mental disorder-related diagnosis, more than 40% had at least one mental disorder-related encounter after deploying. This study provided valuable evidence regarding servicemembers who deploy with preexisting conditions; however, it neglected to document the timing of their postdeployment mental health outcomes, and it did not evaluate career outcomes, such as demotions and separation from service.

The goal of the current research effort was to investigate both psychiatric and career outcomes among servicemembers who deploy to combat with preexisting mental disorder diagnoses. Our study differs from Taubman (2009) in two substantive ways. First, Taubman's (2009) primary outcome was first mental disorder diagnosis that occurred at any time following an individual's initial combat deployment. Thus, number of combat deployments varied within the sample, making it unfeasible to study the effects of multiple deployments when examining psychiatric outcomes. This issue is important because multiple deployments are, like prior psychiatric disorders, a plausible risk factor for mental health concerns. Therefore, our methodology was guided by the desire to remove the influence of multiple deployments.

A second way in which our study differs from Taubman (2009) is that we examine behavioral misconduct, documented by demotions and separation from service, as additional outcomes. It is increasingly recognized that behavioral problems are of concern in combat veterans. For example, numerous studies report significant associations between PTSD symptoms and antisocial behavior (Hartl, Rosen, Drescher, Lee, & Gusman, 2005; McFall, Fontana, Raskind, & Rosenheck, 1999; Miller, Greif, & Smith, 2003; Miller, Kaloupek, Dillon, & Keane, 2004). Antisocial or aggressive behavior may include physical or verbal aggression, hazardous driving, substance abuse, and property destruction. Causal pathways between PTSD and antisocial behavior are not yet fully explained, but pertinent concepts may include "externalizing" aspects of PTSD as discussed by Miller and colleagues (Miller et al., 2004). Specifically, in a subset of Marines recently deployed to combat in Iraq and Afghanistan, those who screened high on a standardized PTSD screening test were more than six times as likely to engage in antisocial behaviors as those who did not screen positive for PTSD (Booth-Kewley, Larson, Highfill-McRoy, Garland, & Gaskin, 2010). Additionally, in a different study, Booth-Kewley, Highfill-McRoy, Larson, and Garland (2010) concluded that Marines who had a postcombat mental illness were five times as likely to receive a demotion as Marines with no psychiatric diagnoses. Associations between psychiatric diagnoses and separation resulting from bad conduct discharges after deployment have also been documented (Booth-Kewley, Highfill-McRoy, et al., 2010). Therefore, it is important to examine behavioral measures, or military performance proxies thereof, when assessing the implications of preexisting mental disorders and characterizing the mental health of combat veterans.

METHOD

Participants and Procedure

Data used in this study were obtained from the Career History Archival and Medical Personnel System (CHAMPS), an electronic database maintained by the Naval Health Research Center. CHAMPS includes details of inpatient and outpatient medical encounters reimbursed via TRICARE Management Activity during active military service, with the exception of medical encounters that occur in a combat zone (Gunderson, Garland, Miller, & Gorham, 2005). CHAMPS also includes dates and details of enlistment, retention, and separation. Deployment history, including dates and locations of deployment, was obtained from the Defense Manpower Data Center.

The study period for this records-based, longitudinal research spanned 2002–2008. Subjects initially included all Marines first enlisting for a 4-year term during the fiscal years 2002–2005 ($N = 136{,}300$). Final inclusion criteria for the study required participants to have a combat deployment followed by a 6-month, postcombat-deployment follow-up period prior to January 2009 ($n = 70{,}451$ were excluded). Combat deployment was defined as deploying to Iraq, Afghanistan, or Kuwait. Officers ($n = 1{,}494$) were excluded as were Marines who transferred to another military branch ($n = 141$). Marines who died during the study observation period ($n = 324$) were also excluded.

The remaining records ($N = 63{,}890$) were then divided into two combat-deployed Marine cohorts based on the presence ($n = 3{,}258$) or absence ($n = 60{,}632$) of a psychiatric diagnosis prior to the start of their first combat deployment.

Measures

Participants were classified has having a psychiatric diagnosis if they had an outpatient or hospitalization record with an International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnostic code between 290 and 316 (excluding tobacco disorders, 305.10, postconcussive disorders, 310.20, and tension headaches, 307.81) (Practice Management Information Corporation, 2006). Mental health disorders among Marines in the cohort with preexisting diagnoses were classified as new-onset if the diagnosis recorded postdeployment was in a new ICD-9-CM category when compared to predeployment, preexisting diagnoses received during military service. For Marines in the cohort with no preexisting diagnoses, all diagnoses recorded following combat deployment were new-onset. Psychiatric diagnoses were further classified into the following major categories: substance-related, adjustment disorders, mood disorders, personality disorders, anxiety disorders (including PTSD), sleep disorders, and other mental disorders (per Hoge et al., 2002). Posttraumatic stress disorder was examined separately as well as counted within the anxiety disorder category.

Associations between cognitive ability, mental disorders, and behavioral outcomes were examined as well. Cognitive ability is one of the criteria for enlistment and induction in the military, and is measured by the Armed Forces Qualification Test (AFQT) score derived from the Armed Services Vocational Aptitude Battery (ASVAB; as cited in U.S. Department of Defense, 1984). The AFQT score was divided into three categories (low, moderate, high) based upon the military's use of this measurement during the enlistment process. As a measure of general cognitive ability, the AFQT, which assesses mathematics, vocabulary, and reading skills, has been shown to correlate with standardized intelligence tests (Dickens & Flynn, 2006; Kennedy, Kupke, & Smith, 2000; Orme, Brehm, & Ree, 2001). Specifically, in one study (Deary, Irwing, Der, & Bates, 2007) the general cognitive (g) factor of the ASVAB was found to have nearly perfect (>0.99) correlation with the g factor from Kyllonen's (1993) Cognitive Abilities Assessment battery (Stauffer, Ree, & Carretta, 1996). Significant associations have also been previously reported between cognitive ability and mental disorders (Batty et al., 2010). For example, Koenen et al. (2009) concluded that higher childhood intelligence quotient (IQ) predicted a 29%, 95% confidence interval (CI) [8%, 45%], reduction in the odds of having a generalized anxiety disorder. Likewise, cognitive ability was significantly associated with negative behavioral outcomes in a study of Marines by Booth-Kewley, Highfill-McRoy, et al. (2010), who found that high AFQT scores significantly reduced the risk of being discharged for bad conduct ($HR = 0.6$). Therefore, AFQT score was used as a covariate in our analyses.

Data Analysis

Chi-square analysis was used to compare all demographic, deployment, and mental health variables between each Marine cohort. Univariate and multivariate logistic regression models were constructed to determine risk factors for each of the four study outcomes of interest: any postdeployment mental health diagnoses, any new-onset postdeployment mental health diagnoses, demotions, and separation from service. Univariate regressions were conducted on the entire sample ($N = 63{,}890$). Multivariate regressions were calculated for smaller subsamples ranging from $n = 62{,}461$–$63{,}094$ Marines due to missing information for several predictor variables. To control for demographic influences on the dependent measures, sex, age at deployment, and race/ethnicity were forced into the multivariate models. The *OR*s and 95% CIs were calculated. Statistical significance was set at $p < .05$ (two-tailed) for all analyses. Statistical analyses were performed using SPSS software (SPSS, Inc., 2008).

The entire study sample of Marines ($N = 63{,}890$) was followed for 6 months after their first combat deployment. For Model 1, participants were categorized as either having any postdeployment mental health diagnoses ($n = 3{,}481$) or no postdeployment mental health diagnoses ($n = 60{,}409$). For Model 2, participants were classified as having any new-onset postdeployment mental health diagnoses ($n = 3{,}232$), which was defined as having a mental health diagnosis in a specific ICD-9-CM category they were not diagnosed with prior to their first combat deployment, or no new-onset postdeployment mental health diagnoses ($n = 60{,}658$). Any and new-onset categories were not mutually exclusive. Moreover, for category-specific analyses, participants who were diagnosed with more than one psychiatric disorder after their first combat deployment during the follow-up period were counted in every diagnostic category that they represented. For example, an individual with more than one new-onset psychiatric diagnosis (e.g., adjustment disorder and sleep disorder) was counted in each category-specific analysis but was only counted once in the overall new-onset analysis.

Two additional outcomes were evaluated during the 6-month postdeployment follow-up period: military demotions and separation from service. Again, the entire study sample of Marines ($N = 63{,}890$) was stratified into two groups: those who had been demoted in military rank during the follow-up period ($n = 2{,}479$) and those without a demotion ($n = 61{,}411$). Participants were also categorized by separation status: no loss ($n = 61{,}935$), or separation, including both voluntary/normal discharge and involuntary/early discharge ($n = 1{,}955$).

RESULTS

Demographic characteristics are displayed in Table 1. All participants were enlisted Marines, whose age at the time of their first combat deployment ranged from 17 to 42 years of age (age at deployment was dichotomized for the analysis, using the mean age of 21 years as the cutpoint). The majority of the sample was White (71.4% no preexisting mental health diagnoses cohort; 75.5% any preexisting mental health diagnoses cohort) and male (96.6% no preexisting diagnoses; 92.8% any preexisting diagnoses). Chi-square analysis showed that the combat-deployed Marine cohort with any preexisting mental health diagnoses significantly differed from the cohort with no preexisting diagnoses on sex, age at deployment, and race.

With regard to postdeployment mental health outcomes, 16.3% of Marines with preexisting diagnoses had at least one postdeployment diagnosis of any type (preexisting or new-onset) during the 6-month follow-up period, in comparison with 4.9% of Marines without preexisting diagnoses (Table 1). Also, 8.7% of Marines in the preexisting diagnoses cohort had at least one new-onset postdeployment diagnosis, when compared to their predeployment diagnoses, during the follow-up period versus 4.9% of those without preexisting diagnoses. New-onset anxiety disorders had the highest frequency among Marines with any preexisting diagnoses (3.5%), whereas new-onset substance-related disorders were most common among the cohort with no preexisting diagnoses (2.0%). Marines with any preexisting mental health diagnoses significantly differed from the cohort with no preexisting diagnoses in every subcategory of new-onset disorders, except in substance-related diagnoses.

Career outcomes showed a similar trend. Almost 8% of Marines with preexisting diagnoses were demoted during the 6 months following their first combat deployment compared with 3.7% of participants in the no preexisting diagnoses cohort ($p < .001$; Table 1). Similarly, separation from service, as defined by separation status, indicated that of Marines who had any preexisting mental health diagnoses before their first combat deployment, 6.5% separated within 6 months after returning home. This percentage was significantly higher than the separation rate among those without preexisting diagnoses (2.9%, $p < .001$).

Predictors of Psychiatric Diagnoses in the 6 Months Following Deployment

Table 2 presents the results of two logistic regression models: Model 1 shows the predictors for any psychiatric diagnoses in the 6-month period following combat deployment (any postdeployment diagnosis outcome); Model 2 displays the predictors of any new-onset mental health diagnoses postdeployment (Any new-onset postdeployment diagnosis outcome, meaning any postdeployment diagnoses in a new category when compared to predeployment, preexisting diagnoses). The preexisting mental health diagnoses variable had the strongest univariate association with having any postdeployment diagnoses, $OR = 3.82$, 95% CI [3.45, 4.22], $p < .001$, and continued to be the greatest risk factor in the multivariate model as well, $OR = 3.61$, 95% CI [3.26, 4.00], $p < .001$ (see Table 2, Model 1). Additionally, female sex and being 21 years or older at the time of deployment were significant predictors of the any postdeployment diagnoses outcome. Having a Black or Hispanic racial identity and a high AFQT score were protective factors against having any postdeployment diagnoses.

The predeployment factors associated with any new-onset postdeployment diagnoses (Table 2, Model 2) included having any preexisting mental health diagnoses prior to combat deployment and female sex. Marines with at least one preexisting diagnosis before deployment were 1.81, 95% CI [1.56, 2.12], $p < .001$, times more likely to be diagnosed with any new-onset mental health disorder during the 6 months following deployment. High AFQT score and Black or Hispanic race again appear to be protective. Age at deployment was the only variable that was not a significant predictor of this mental health outcome.

Predictors of Demotions and Separation in the 6 Months Following Deployment

Predeployment factors associated with postdeployment military demotion are shown in Table 3. The strongest predictor of demotion was having any predeployment mental health diagnoses, $OR = 2.27$, 95% CI [1.99, 2.60], $p < .001$, and this association was slightly stronger in the multivariate model in the presence of demographics, $OR = 2.34$, 95% CI [2.04, 2.69], $p < .001$. The Black subcategory of the race/ethnicity variable was positively associated with the demotion outcome, $OR = 1.55$, 95% CI [1.36, 1.78], $p < .001$. Marines who were 21 years or older at the time of deployment and those who achieved a moderate or high AFQT score were significantly less likely to be demoted in the 6 months following their first combat deployment. Sex was the only variable that was not a significant predictor of demotions.

At the univariate level, postdeployment separation was significantly associated with female sex, being 21 years or older at the time

Table 1. Demographic and Diagnostic Category Comparisons for Two Combat-Deployed Marine Cohorts

	No preexisting mental health diagnoses[a] $n = 60{,}632$		Any preexisting mental health diagnoses $n = 3{,}258$	
Characteristic[b]	*n*	%	*n*	%
Sex				
Male	58,548	96.6	3,024	92.8***
Female	2,084	3.4	234	7.2**
Age at deployment, years				
<21	35,857	59.1	1,437	44.1***
≥21	24,774	40.9	1,821	55.9***
Race/ethnicity				
White	42,760	71.4	2,464	75.5***
Black	4,500	7.5	199	6.2
Hispanic	9,518	15.9	397	12.3*
Other/mixed	3,098	5.2	159	4.9
AFQT score				
Low (≤51)	22,119	36.8	1,150	35.7
Moderate (52–69)	18,587	31.0	1,067	33.1
High (≥70)	19,321	32.2	1,006	31.2
Any postdeployment diagnosis[c]	2,949	4.9	532	16.3***
Any new-onset diagnosis[c,d]	2,949	4.9	283	8.7***
Substance-related disorders	1,218	2.0	59	1.8
Adjustment disorders	666	1.1	64	2.0***
Mood disorders	783	1.3	85	2.6***
Personality disorders	261	0.4	47	1.4***
Anxiety disorders	1,077	1.8	114	3.5***
PTSD	715	1.2	89	2.7***
Sleep	158	0.3	15	0.5*
Other mental disorders	510	0.8	67	2.1***
Demotions	2,220	3.7	259	7.9***
Separation[e]	1,744	2.9	211	6.5***

Note. AFQT = Armed Forces Qualification Test; Dx = diagnosis; PTSD = posttraumatic stress disorder.
[a]Reference group = No mental health diagnoses cohort. [b]The total *n* for several characteristic variables does not match the total *n* for each combat-deployed Marine cohort due to missing information. [c]The any and new-onset postdeployment diagnosis categories were not mutually exclusive. [d]Participants were counted in every diagnostic category that they represented. [e]Separation from service was classified as (1) no loss (reference) and (2) separation, including both voluntary (normal discharge) and involuntary (early discharge).
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

of deployment, Hispanic race, and having any preexisting mental health diagnoses. Race and AFQT score fell out of the multivariate model; however, older age at deployment, $OR = 3.42$, 95% CI [3.10, 3.78], $p < .001$, was the strongest predictor of separation from service, including both voluntary and involuntary separation (Table 3). Marines with at least one preexisting diagnosis before deployment were 2.00, 95% CI [1.70, 2.29], $p < .001$, times more likely to be separated during the 6 months following deployment. Female sex, $OR = 1.44$, 95% CI [1.17, 1.78], $p < .001$, was also a significant risk factor for separation in the multivariate analysis.

DISCUSSION

This study investigated associations between preexisting psychiatric disorders and psychiatric and career outcomes following combat deployments. Servicemembers with preexisting mental health diagnoses were hypothesized to be at increased risk for postcombat psychological maladjustment and adverse career outcomes. Consistent with our hypothesis, Marines with a preexisting diagnosis were 3.6 times more likely to have at least one postdeployment mental health disorder within 6 months after deployment when compared with the cohort of combat-deployed Marines with no prior

Table 2. Logistic Regression Results for Psychiatric Diagnosis Outcomes Among Combat-Deployed Marines

	Univariate		Multivariate	
Variable	*OR*	95% CI	*OR*	95% CI
Model 1				
Any postdeployment diagnoses				
Preexisting diagnoses[a]				
Any preexisting diagnoses	3.82***	[3.45, 4.22]	3.61***	[3.26, 4.00]
Sex[b]				
Female	1.93***	[1.67, 2.22]	1.83***	[1.58, 2.12]
Age at deployment, years[c]				
≥21	1.12***	[1.04, 1.20]	1.07*	[1.00, 1.15]
Race/ethnicity[d]				
Black	0.76***	[0.66, 0.88]	0.73***	[0.63, 0.85]
Hispanic	0.74***	[0.67, 0.83]	0.72***	[0.65, 0.80]
Other/mixed	0.94	[0.81, 1.10]	0.92	[0.79, 1.08]
AFQT score[e]				
Moderate (52–69)	0.99	[0.92, 1.08]	0.95	[0.87, 1.03]
High (≥70)	0.82***	[0.75, 0.89]	0.76***	[0.69, 0.83]
Model 2				
Any new-onset postdeployment diagnoses				
Preexisting diagnoses[a]				
Any preexisting diagnoses	1.86***	[1.64, 2.11]	1.81***	[1.56, 2.12]
Sex[b]				
Female	1.80***	[1.54, 2.08]	1.81***	[1.55, 2.11]
Age at deployment, years[c]				
≥21	1.04	[0.97, 1.12]	1.04	[0.97, 1.12]
Race/ethnicity[d]				
Black	0.78**	[0.67, 0.90]	0.74***	[0.63, 0.86]
Hispanic	0.75***	[0.67, 0.83]	0.71***	[0.64, 0.79]
Other/mixed	0.96	[0.81, 1.12]	0.93	[0.79, 1.09]
AFQT score[e]				
Moderate (52–69)	0.99	[0.91, 1.08]	0.95	[0.87, 1.03]
High (≥70)	0.82***	[0.75, 0.90]	0.76***	[0.70, 0.83]

Note. $N = 63{,}890$. AFQT = Armed Forces Qualification Test. Univariate logistic regressions were conducted on the entire sample; multivariate logistic regressions were calculated for a total of $n = 62{,}461$ Marines due to missing information.
[a]Reference group = No preexisting diagnoses. [b]Reference group = Male. [c]Reference group ≤21. [d]Reference group = White. [e]Reference group = Low (=51).
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

psychiatric diagnoses. This finding is also consistent with the Taubman (2009) study of servicemembers deployed to Iraq and Afghanistan across all armed forces within the DoD. The present study, however, found an even stronger association between preexisting conditions and later psychological diagnoses among Marines. In addition, our study differentiated between reoccurring and new-onset mental health diagnoses to characterize changes in mental health more accurately. Specifically, the same condition diagnosed both pre- and postdeployment may be a sign of stability of mental health problems. New-onset conditions, however, most likely represent a clinically meaningful worsening of mental health. Our results indicate that Marines who had any preexisting mental health diagnoses before their first combat deployment were at an increased risk of having a postdeployment new-onset mental health disorder compared with Marines without preexisting conditions.

Several other variables were also associated with postdeployment psychiatric diagnoses. Marines with a high AFQT score were less likely to have a new-onset postdeployment diagnosis. The apparent protective effect of high cognitive ability is consistent with other work on correlates of mental disorders (Batty et al.,

Table 3. Logistic Regression Results for Demotions and Separation Outcomes Among Combat-Deployed Marines

	Univariate		Multivariate	
Variable	*OR*	95% CI	*OR*	95% CI
Demotions[a]				
Preexisting diagnoses[b]				
Any preexisting diagnoses	2.27***	[1.99, 2.60]	2.34***	[2.04, 2.69]
Sex[c]				
Female	0.94	[0.76, 1.17]	0.87	[0.69, 1.09]
Age at deployment, years[d]				
≥21	0.88**	[0.81, 0.95]	0.86**	[0.79, 0.94]
Race/ethnicity[e]				
Black	1.69***	[1.48, 1.92]	1.55***	[1.36, 1.78]
Hispanic	1.02	[0.91, 1.14]	0.96	[0.85, 1.07]
Other/mixed	1.03	[0.85, 1.24]	1.00	[0.82, 1.20]
AFQT score[f]				
Moderate (52–69)	0.84***	[0.77, 0.93]	0.87**	[0.79, 0.96]
High (≥70)	0.62***	[0.56, 0.68]	0.65***	[0.58, 0.72]
Separation[gh]				
Preexisting diagnoses[b]				
Any preexisting diagnoses	2.34***	[2.02, 2.71]	2.00***	[1.70, 2.29]
Sex[c]				
Female	1.44**	[1.17, 1.77]	1.44**	[1.17, 1.78]
Age at deployment, years[d]				
≥21	3.51***	[3.18, 3.88]	3.42***	[3.10, 3.78]
Race/ethnicity[e]				
Black	0.86	[0.72, 1.04]	0.88	[0.73, 1.05]
Hispanic	0.88*	[0.77, 1.00]	0.92	[0.81, 1.05]
Other/mixed	0.82	[0.66, 1.02]	0.81	[0.65, 1.01]
AFQT score[f]				
Moderate (52–69)	1.04	[0.93, 1.16]		
High (≥70)	1.01	[0.90, 1.12]		

Note. $N = 63{,}890$. AFQT = Armed Forces Qualification Test. Univariate logistic regressions were conducted on the entire sample.
[a]The demotions outcome multivariate logistic regression was calculated for a total of $n = 62{,}461$ Marines due to missing information. [b]Reference group = No preexisting diagnoses. [c]Reference group = Male. [d]Reference group = <21. [e]Reference group = White. [f]Reference group = Low (=51). [g]The separation outcome multivariate logistic regression was calculated for a total of $n = 63{,}094$ Marines due to missing information. [h]Separation from service was classified as (1) no loss (reference) and (2) separation, including both voluntary (normal discharge) and involuntary (early discharge).
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

2010; Koenen et al., 2009). Research to determine the causal mechanisms whereby high intelligence improves resistance to mental health problems could be of great value. Interestingly, servicemembers with Black ethnicity had a 1.6 times greater risk of demotion in the Marine Corps, after controlling for all the other variables in the model. A similar association was found in a recent study of combat-deployed Marines by Highfill-McRoy, Larson, Booth-Kewley, and Garland (2010); African Americans were at an increased risk for punitive discharges, demotions, and drug-related discharges in comparison with Caucasians. Additionally, having any preexisting mental health diagnoses was significantly associated with separation ($OR = 2.00$) at the multivariate level. This finding is consistent with previous military research documenting that personnel who screened positive for a mental health concern were significantly more likely to leave military service during the year after deployment compared with those who screened negative for a mental health problem (Hoge et al., 2006).

The current findings have both scientific and policy implications. Regarding scientific research on mental disorders, it is clear that cross-sectional studies on postcombat cohorts may include

individuals with precombat psychiatric conditions. Results from the current longitudinal analyses illustrate the importance of using prospective designs when determining origin or the cause of psychological harm, as well as the effects of combat among OIF/OEF veterans. Thus far, little research has been conducted on groups with preexisting mental disorders, despite the potential vulnerability of this group to additional psychological harm as a function of combat.

Policy implications include a necessity for more vigorous medical record review during pre- and postdeployment screening. Current military doctrine requires a mandatory review of a servicemember's medical record, as a part of predeployment health assessment procedures (DoD, 2010), to rule out deployment-limiting psychiatric conditions. Importantly, potential benefits of additional predeployment screening were recently demonstrated in a novel study of soldiers (Warner et al., 2011). This study demonstrated that enhanced predeployment screening was significantly associated with reduced warzone mental health problems. Because the current findings indicate that servicemembers who deploy with preexisting psychiatric diagnoses are at increased risk for postdeployment mental health concerns and negative career outcomes, it may also be appropriate to mandate full medical record review during postdeployment screening procedures, in conjunction with mandatory postdeployment interviews for service members who deployed with prior disorders (Assistant Secretary of Defense for Health Affairs, 2005, 2008; Nevin, 2009; U.S. Department of Defense, 2006, 2010; U.S. Department of the Navy, 2009).

The current study had several limitations. Though intensity of combat exposure is an important risk factor for postdeployment mental disorders, no information on the frequency, type, or duration of traumatic events experienced during combat was available to the researchers. Previous research has established both intensity (level or type of combat) and exposure (length, frequency, and dwell time between deployments), as important covariates when predicting mental health outcomes among combat veterans (Castro & McGurk, 2007). Likewise, Dohrenwend et al. (2006) demonstrated a strong dose-response relationship between combat exposure and PTSD occurrence. Similarly, no information was available on premilitary psychiatric conditions, which may limit interpretation of study results. In addition, this study was restricted to first combat deployment only, which potentially limits the generalizability to subsequent deployments. Additional limitations revolve around the completeness and accuracy of military health care and personnel career records used for analysis as evidenced by missing data on several predictor variables. For example, patients who received care from nonmilitary sources could have been misclassified as having no preexisting or postcombat diagnosis. Likewise, returning from deployment can represent a difficult readjustment period in which symptoms of mental disorders may temporarily spike without long-lasting consequences.

Despite these limitations, the strength of the longitudinal approach used in this analysis is notable, and the findings strongly support the use of prospective study designs that include precombat mental health status. Furthermore, our findings suggest that more-rigorous postdeployment screening may be appropriate for service members who deploy with preexisting psychiatric conditions.

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14. ABSTRACT

Preexisting mental disorders are not always considered in mental health studies with military populations, even though prior diagnoses may be a risk factor for additional psychiatric harm stemming from combat exposure, as well as postdeployment behavioral problems. The objectives of this study were to investigate postcombat psychiatric and career outcomes among Marines with preexisting mental disorder diagnoses who deployed to combat in Iraq or Afghanistan during 2002–2008. Marines with a preexisting diagnosis were 3.6 times more likely to have at least one postdeployment mental health disorder within 6 months postdeployment compared with Marines with no prior psychiatric diagnoses. Marines with a preexisting diagnosis were also 1.8 times more likely to receive a new-onset psychiatric diagnosis within 6 months postdeployment, indicating that postdeployment mental health concerns in this cohort extend beyond continuation of earlier disorders. Additionally, demotions and personnel loss were significantly associated with having any preexisting mental health diagnoses (OR = 2.34 and 2.00, respectively). Based on the current findings, it may be advisable to mandate a full medical and psychiatric record review during deployment health screening as part of new initiatives to address whether combat exposure has worsened preexisting conditions or compounded them with new-onset concerns.

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